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**Preliminary Program**

Complimentary East Coast Proceeding for all attendees who REGISTER BEFORE MARCH 1ST, 2000

The Tenth Annual West Coast Conference on

# Contaminated Soils and Water

## Analysis, Fate, Environmental and Public Health Effects, and Remediation

March 20-23, 2000

DoubleTree Hotel, Mission Valley

San Diego, California

### CONFERENCE HIGHLIGHTS

- 90 Presentations
- Socials
- Fourth Annual "Dirt Classic" Golf Tournament
- Exhibitors
- 12 Workshops
- Tour of North Shore Naval Air Station

### CONFERENCE DIRECTORS

**Paul T. Kostecki, Ph.D. • Edward J. Calabrese, Ph.D.**
Environmental Health and Sciences
School of Public Health
University of Massachusetts • Amherst, MA 01003

### *FREE 1 Year Membership to AEHS For Registered Attendees*

### MEMBERSHIP BENEFITS INCLUDE:

- A full year subscription to the *International Journal of Phytoremediation* with the option to subscribe to the *Journal of Soil Contamination* at the reduced rate of $65
- *Soil and Groundwater Cleanup Magazine*
- 25% discount on CRC/Lewis and Ann Arbor Press books purchased through AEHS
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# About the Conference

This March will mark the tenth annual gathering of environmental professionals to the West Coast Conference on Contaminated Soils and Water. For the past nine years, this annual conference has helped to bring the environmental science community closer together by providing a forum to facilitate the exchange of information of technological advances, new scientific achievements, and the effectiveness of standing environmental regulation programs.

Attracting over 400 participants in 1999, the West Coast Conference is a highly successful and nationally known conference focusing on important and timely environmental issues related to soil and water contamination. Attendees are drawn from a variety of professions including state and federal regulatory agencies, environmental engineering and consulting firms, the petroleum and chemical industries, and academia.

The 2000 conference promises to be an exciting opportunity for environmental professionals who are concerned with developing creative, cost-effective assessments and solutions that can withstand the demands of regulatory requirements.

## WHO SHOULD ATTEND

- Environmental educators and students
- Federal, state, county, and municipal officials responsible for the development and implementation of environmental regulatory programs, as well as those responsible for issues arising from contaminated soils and water
- Consultants providing advice and guidance to property owners and businesses
- Attorneys with commercial and industrial clients
- Real estate, insurance, and banking representatives
- Environmental engineers, managers, and consultants
- Analytical laboratory staff specializing in environmental contamination

## WHY YOU SHOULD ATTEND

The Tenth Annual West Coast Conference on Contaminated Soils and Water offers attendees an opportunity to exchange findings, ideas and recommendations in a professional setting. The strong and diverse technical program has been developed to meet the changing needs of the environmental field.

Platform and poster sessions feature research, case studies, and the presentation of new programs. Equipment demonstrations augment the exhibition hall and bring applied technology to attendees. Focused evening workshops provide attendees with practical information for immediate application.

## SOCIAL PROGRAM

To facilitate the networking opportunities, not to mention the enjoyment of all conference participants, we have expanded this year's social program. The 2000 West Coast Conference socials include the Fourth Annual "Dirt Classic" Golf Tournament (see *Conference at a Glance* for more details), afternoon socials - including complimentary drinks and refreshments from 4:00pm to 6:00pm - accompanying the afternoon poster presentations, and a Monday evening wine tasting welcome reception. Advance registration for the Golf Tournament is required.

# Registration Form

## Tenth Annual Conference on Contaminated Soils and Water

**Name** ❑ Mr. ❑ Ms. ❑ Dr. _____

**Company or Affiliation** _____

**Address** _____

**City** _____ **State** _____ **Zip** _____ **Country** _____

**Telephone** _____ **Fax** _____ **e-mail** _____

Please send completed form with full payment to AEHS, 150 Fearing Street, Amherst, MA 01002, Tel 413-549-5561, Fax 413-549-0579

**REGISTRATION TYPE** ❑ Regular ❑ Sponsor/Supporter ❑ Poster Presenter ❑ Student ❑ Speaker ❑ Exhibitor ❑ State, Federal or Municipal

**ADVANCE REGISTRATION FEES** (**Postmarked on or before March 1, 2000** to receive complimentary proceedings)

| | |
|---|---|
| Regular conference registration | $495 00 _____ |
| AEHS Member | $375 00 _____ |
| Student | $155 00 _____ |
| AEHS Student Member | $75 00 _____ |
| Sponsor, supporter | $295 00 _____ |
| Poster presenter | $150 00 _____ |
| Municipal State or Federal Personnel | $50 00 _____ |
| **ON SITE REGISTRATION FEES** (Received after March 1, 2000 or processed at the conference) | $50 00 _____ |
| Add a 1 year subscription to the *Journal of Soil Contamination* (1 year subscription to the *International Journal of Phytoremediation* is included in the free 1 year membership to AEHS) | $65 00 _____ |

**EVENING WORKSHOP FEES** (please refer to the schedule to avoid any scheduling conflicts)

**Monday, March 20, 2000**

8 00am Noon

❑ 1 SW 846 New Model, Technologies and Techniques $95 00 _____

1 00pm 4 00pm

❑ 2 A Multiphase Screening Method to Determine Fuel Immobility in the Unsaturated Zone** $95 00 _____

2 00pm 5 00pm

❑ 3 Sampling Designs and Statistical Methods in Environmental Studies $95 00 _____

❑ 4 *Air Sparging Evaluation Design and Case Studies* $95 00 _____

4 00pm-6 00pm

❑ 5 Environmental Fate of Hydrocarbons in Soils and Groundwater *(Book Included)* $135 00 _____

❑ 6 MTBE Remediation Workshop $95 00 _____

**Tuesday, March 21, 2000**

7 00pm 9 00pm

❑ 7 Moving Phytoremediation out of the Laboratory and into the Field $95 00 _____

❑ 8 Use of PC Spreadsheet Analytical Model to Estimate MTBE Plume Length* $95 00 _____

❑ 9 Results of Air Force Remedial Process Optimization Guidance Document and Demonstration $95 00 _____

**Wednesday, March 22, 1999**

7 00pm 9 00pm

❑ 10 MTBE Regulatory Roundtable* $95 00 _____

❑ 11 GeoTracker and GEIMS California SWRCB's Integrated Ground Water Management System $95 00 _____

❑ 12 Update on Petroleum Hydrocarbon Issues in California Implications for Site Closure $95 00 _____

NOTE If you are not registered for the conference and are only registering for a workshop add $100 00 _____

*Free to municipal, state and federal employees registered for the conference Check workshop you are interested in to reserve your space

**Free to municipal state, federal and Shell/Equilon employees registered for the conference Check workshop you are interested in to reserve your space

**MEALS**

| | |
|---|---|
| Lunch, Tuesday, March 21, 2000 | $20 00 _____ |
| Lunch, Wednesday, March 22 2000 | $20 00 _____ |
| Lunch, Thursday, March 23, 2000 | $20 00 _____ |

**NORTH SHORE TOUR**

❑ I am interested in the North Shore Tour Please reserve a space in my name

**Total** _____

**Please indicate method of payment**

❑ Check (please make checks payable to AEHS Inc [EIN #043117336])

❑ Purchase Order Number _____

(PO number must be enclosed with this form, fee is to be paid in full at or before conference)

Please Charge ❑ Mastercard ❑ Visa ❑ Diners Club ❑ Amex

Account Number _____ Expiration Date _____

Cardholder Name _____ Signature _____

Encumbered purchase orders will be accepted from institutions and agencies for the purpose of preregistration only Full payment, including those preregistrations secured by purchase order, must be remitted at the on site registration Non compliance will result in a $25 00 processing fee for any resulting billings Cancellations will be assessed a $50 00 fee

**Please Check One:** Type of Company or Organization

- ❑ 01 Academic
- ❑ 02 Consulting Engineer
- ❑ 03 Equipment/Product Manufacturers
- ❑ 04 Federal Agency
- ❑ 05 Legal, Banking, Real Estate
- ❑ 06 Military
- ❑ 07 State, County, Municipal Agencies
- ❑ 08 Transportation
- ❑ 09 Utility Industry
- ❑ 10 Other (specify) _____

**Membership Benefits of AEHS Include:**

- A 1 year subscription to the *International Journal of Phytoremediation* with the option to subscribe to the *Journal of Soil Contamination* at the reduced rate of $65/year
- Soil and Groundwater Cleanup Magazine
- 10% discount on books from Amherst Scientific Publishers
- 25% discount on CRC/Lewis and Ann Arbor Press books purchased through AEHS

**Office Use:**

Date _____ Paid _____

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# General Information

**REGISTRATION INFORMATION**
Advance and on-site registration includes admission to all platform sessions, poster sessions, the exhibit area and coffee breaks. Workshops and lunches are NOT included in the full registration fee, but may be purchased separately on the conference registration form. The conference registration form is now available on-line. The printed version of the preliminary program (which contains a registration form) will be available in late December.

All charge orders must be signed. Full payment, including those pre-registrations secured by purchase order must be remitted at the on-site registration. Non-compliance will result in a $25.00 processing fee for any resulting billings. Phone-in registrations will not be accepted.

**PURCHASE ORDERS** will be accepted from institutions and agencies for the purpose of preregistration only.

**CANCELLATIONS** received In WRITING by March 1, 2000 will receive a full refund minus a $50.00 processing fee. NO REFUNDS WILL BE ISSUED FOR CANCELLATIONS AFTER MARCH 2, 2000. You may substitute a conferee rather than cancel the registration entirely.

**SPONSORS AND SUPPORTERS** are eligible for complimentary registrations, according to respective guidelines. Employees of sponsoring and supporting organizations may register at the reduced rate of $295 You must clearly indicate on your registration form that you are affiliated with a sponsoring or supporting organization in order to qualify for the reduced rate.

**REGULATORY** personnel and employees of any State, County, Regional, Municipal, or Federal agency qualify for a registration rate of $50.00 - however you MUST PRE-REGISTER in order to receive this special rate.

**WORKSHOPS** (Not included in conference registration)
Early registration is encouraged as space is limited and materials must be prepared in advance. Please check the workshop schedule carefully when selecting workshops - same day workshops may run simultaneously.

**POSTER SESSIONS**
Posters may be viewed throughout the 3 day conference in the designated areas. Authors will be available at their posters Tuesday, March 21 and Wednesday, March 22 from 4:00-6:00 PM.

**EXHIBIT INFORMATION**
An exhibition of relevant technologies and services will be in the new 4100 square foot exhibition hall that is located on the first floor. The Exhibit Hall will be open Monday, March 20th from 2-8PM, Tuesday, March 21st and Wednesday, March 22nd from 8:30 AM - 6:00 PM. A limited number of booths may be available. Call 413-549-5170 for exhibitor information.

**LOCATION AND TRAVEL INFORMATION**
This year the conference will be held at the DoubleTree Hotel San Diego Mission Valley. Here just 10 minutes from San Diego International Airport. Delight in a world of sight-seeing pleasures--miles of sunny beaches, charming Old Town, the San Diego Zoo, Sea World, Wild Animal Park, U.S. Navy facilities and Qualcomm Stadium. Plus, you can get a taste of Mexico in Tijuana, just a short drive south. The San Diego light rail station stop is located adjacent to the DoubleTree main entrance at Hazard Center.

**ACCOMMODATION INFORMATION**
The hotel has 300 guest rooms and suites--all with mini-bars and PC dataports. Enjoy casual all-day dining at the Fountain Cafe, toast the day's little victories at the Windows Lobby Bar. Also available is nightly entertainment and dancing at their fabulous night club.

Room rate is: Single/Double ($119) per night.

The DoubleTree Hotel San Diego Mission Valley, 7450 Hazard Center Drive, San Diego, CA 92108. Telephone: 1-619-297-5466; FAX: 1-619-688-4088. You can also visit their website HYPERLINK http://www.doubletreehotels.com http://www.doubletreehotels.com . Attendees are responsible for their own hotel arrangements

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## DoubleTree Hotel, Mission Valley (Registration Form)

7450 Hazard Center Dr., San Diego, CA 92108 For reservations, contact the hotel directly by telephone (619) 297-5466 or fax (619) 688-4088. Do not send hotel reservations to AEHS

Guest Name _____

Address _____

City/State/Zip _____

Telephone _____

Arrival Date _____ Departure Date _____

Please Reserve _____ Single @ $119.00

_____ Double @ $119.00

Room tax is an additional 10%

Sharing with _____

Special requests _____

Group Name: Tenth Annual Conference on Contaminated Soils and Water

Group # _____ Group Dates Arr. _____ Dep. _____

Cut Off Date: February 12, 2000

CREDIT CARD GUARANTEE

Credit Card Type _____ Exp. _____

Credit Card No. _____

Name of Cardholder _____

All reservations must be guaranteed by credit card or personal check for first night room and tax. Reservations may be canceled at no penalty with 48 hours notice. With less than 48 hour cancellation notice hotel will charge for one night's room and tax.

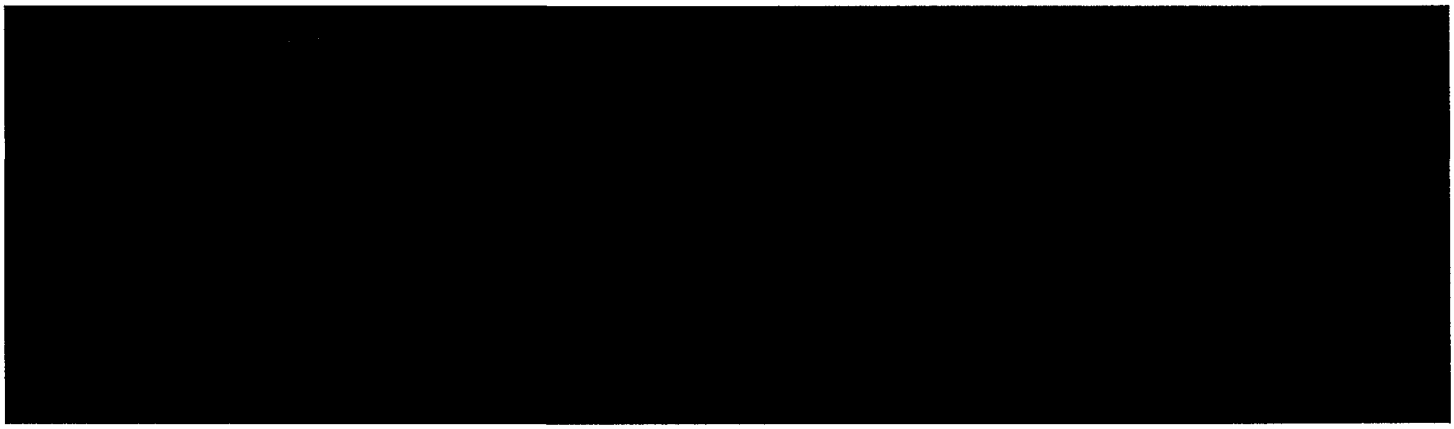
PLEASE READ
If you do not receive written confirmation within 14 days, please contact the hotel. (619) 297-5466

# Conference at a Glance

Conference platform sessions and workshops may run concurrently. Please check the schedule. This is a preliminary program and is subject to change. If you need to schedule hotel and travel plans, please contact the conference coordinator to confirm the date and time of the workshop or presentation you are interested in.

## Sunday, March 19 4TH ANNUAL "DIRT CLASSIC" GOLF TOURNAMENT

The 4th official West Coast "Dirt Classic" will be held on Sunday, March 19, 2000 in San Diego. Space is limited, call Betty at 413-549-5170 for your reservation form. The fee is $100.00 per person which includes greens fees, golf cart, and lunch. Golf reservations must NOT be included with your conference registration.



## Tuesday, March 21 SESSIONS ARE CONCURRENT

**PLATFORM PRESENTATIONS**

8:00am-Noon

Session 1: **Navy**

Session 2: **Manufactured Gas Plant Sites**

1:30pm-5:00pm

Session 1: **DNAPL Remediation**

Session 2: **Phytoremediation**

Session 3: **Sediments**

**POSTER PRESENTATIONS**

4pm-6pm (complimentary refreshments)

**WORKSHOPS** (7pm-9pm)

7. Moving Phytoremediation out of the Laboratory and into the Field
8. Use of PC Spreadsheet Analytical Model to Estimate MTBE Plume Length
9. Results of Air Force Remedial Process Optimization Guidance Document and Demonstration

## Wednesday, March 22 SESSIONS ARE CONCURRENT

**PLATFORM PRESENTATIONS**

8:00am-Noon

Session 1: **MTBE**

Session 2: **Risk/RBCA**

Session 3: **Innovative Technologies**

1:30pm-5pm

Session 1: **MTBE**

Session 2: **Heavy Metals**

Session 3: **Environmental Forensics**

**POSTER PRESENTATIONS**

4pm-6pm (complimentary refreshments)

**WORKSHOPS**

(Evening 7pm-9pm)

10. MTBE Regulatory Roundtable
11. GeoTracker and GEIMS: California State Water Resources Control Board's Integrated Ground Water Management System
12. Update on Petroleum Hydrocarbon Issues in California: Implications for Site Closure

## Thursday, March 23 SESSIONS ARE CONCURRENT

**PLATFORM PRESENTATIONS**

8:00am-Noon

Session 1: **Perchlorates**

Session 2: **Natural Attenuation**

1:30pm-5:00pm

Session 1: **Innovative Technologies-Chlorinated Solvents**

## Tuesday, March 21, 2000 — MORNING SESSIONS — 8:00am-Noon

### Session 1: NAVY

**Navy Cleanup Perspectives for the New Millenium**
*Dave Olson, CNO, Crystal City, VA*

**The Future of the Department of Energy - Environmental Management in Soils and Groundwater**
*Skip Chamberlain, Department of Energy, Germantown, MD*

**Laser Drilling to Support Environmental Investigations**
*Lorne Everett, ARCADIS Geraghty and Miller, Inc., Santa Barbara, CA*

**Coupling Chemical Oxidation Enhancements with the Bioremediation of Petroleum Hydrocarbon Contaminated Soils using Aerobic Consortia**
*Mark Zappi, Mississippi State University, Mississippi State, MS*

**Current Cleanup Issues in San Diego, CA**
*SWCOMNAVFACENGCOM, San Diego, CA*

**TOUR**
**NORTH ISLAND NAVAL AIR STATION SITE VISIT**
*On Tuesday March 21, the Navy is offering a tour of the North Island Naval Air Station. The tour will include a Chemical Oxidation Site and a Steam Enhanced Removal of LNAPLs Site.*
**The tour will last approximately 1.5 hours - beginning at 3:00pm.**
*Free transportation will be provided. Meet at the registration desk at 2:30pm. The tour is limited to 50 people,*
**so early registration is recommended.**

### Session 2: MANUFACTURED GAS PLANT SITES: NEW REGULATORY AND TECHNICAL DEVELOPMENTS FOR MANAGING CLEANUP

**Background-based Decision Making for PAHs: Development of a Decision Tree Base for Southern California**
*Robert Scofield, Environ, Emeryville, CA*

**Environmentally Acceptable Endpoints for MGP Sites**
*Hans Stroo, ThermoRetec, Carson, CA*

**New Developments in Leaching of Organic Compounds from Soils**
*William Rixley, University of Houston, Houston, TX*

**What is an Area of Contamination and How to Deal with them at MGP Sites**
*Don Shosky, Earth Tech, Englewood, CO*

**Application of Full-Scale in Situ Ozonation for Recalcitrant PAH Compounds**
*Ron Jensen, Southern California Edison, Rosemead, CA*

**San Diego MGP Site Remediation: Regulatory Approvals, Community Relations, Permitting and Implementation**
*Ken Rowland, Sempra Energy, Los Angeles, CA*

**LUNCHEON PRESENTATION**
**(12pm-1:30pm, Presentation begins at 12:30pm)**
**LEGACY OF THE GULF WAR:**
**A Progress Report on the Cleanup of the Kuwait Oil Lakes**
*Paul Kostecki, University of Massachusetts, Amherst, MA*

## Tuesday, March 21, 2000 — AFTERNOON SESSIONS — 1:30pm-5pm

### Session 1: DNAPL REMEDIATION

**DNAPL Source Zone Remediation Endpoints: Rationale & Measures of Success**
*Suresh C. Rao, Purdue University, West Lafayette, IN*

**Six Phase Heating, Dynamic Underground Stripping and In-Situ Chemical Oxidation**
*Skip Chamberlain, US Department of Energy, Germantown, MD*

**Surfactant-Enhanced Aquifer Remediation for DNAPL Removal**
*S. Laura Yeh, Naval Facilities Engineering Service Center, Port Hueneme, CA*

**A Successful Full-Scale Source Removal of Dense Non-Aqueous Phase Liquids (DNAPLs)**
*Terry C. Sciarrotta, Southern California Edison Company, Rosemead, CA*

**In-Situ Chemical Oxidation: Status and Data Needs**
*Hans Stroo, ThermoRetec, Carson, CA*

**In-Situ Bioremediation of DNAPL Sources**
*David Major, GeoSyntec Consulting, Guelph, Canada*

### Session 2: PHYTOREMEDIATION

**Considerations for Design and Implementation of Phytoremediation Assessment Programs at Petroleum Contaminated Sites: Recent Advances**
*Henry Camp, Arthur D. Little, Cambridge, MA*

**Preliminary Results of Phytoremediation Demonstration Study at Geothermal Waste Disposal Facility**
*Gary R. Foote, Geomatrix Consulting, Oakland, CA*

**Enhanced Metabolism of Halogenated Hydrocarbon in Transgenic Plants**
*Tanya Q. Shang, University of Washington, Seattle, WA*

**Potential for Phytoremediation of Methyl-Tert-Buty-Ether (MTBE)**
*Ellen Rubin, University of Colorado, Denver, CO*

**Site Constraints at NUWC Keyport Landfill: Implications for Designing and Constructing a Phytoremediation Plantation**
*Michael Meyer, URS Greiner Woodward Clyde, Seattle, WA*

**Use of Eucalyptus Trees to Remediate a Shallow, High-Nitrate Aquifer**
*Paul C. Deutsch, Geomatrix Consulting, Fresno, CA*

### Session 3: SEDIMENTS

**In-Situ Biorestoration of Sediments Contaminated with Polycyclic Aromatic Hydrocarbons (PAHs)**
*Mukundan Ramani, University of Cincinnati, Cincinnati, OH*

**Bioavailability of Polycyclic Aromatic Hydrocarbons (PAHs) in Contaminated Sediments**
*Rakesh Govind, University of Cincinnati, Cincinnati, OH*

**Advanced Site Characterization and Data Visualization Using Passive Soil Vapor Surveying, GPS/GIS and 3D-Imaging Tools**
*Rolf U. Halden, Lawrence Livermore National Laboratory, Livermore, CA*

**Sediment Contaminants of the Salton Sea**
*Richard A. Vogl, LFR, Inc., Irvine, CA*

**Studies on In-Situ Bioremediation of PAH Contaminated Sediments: Bioavailability and Toxicity Issues**
*Henry H. Tabak, US EPA, NRMRL, Cincinnati, OH*

**Investigation and Remediation of Contaminated Sediments in the Niagara River, Western New York State**
*Mark S. Raybuck, Parsons Engineering Science, Williamsville, NY*

**Modeling Competitive Sorption and Desorption Kinetics of Polycyclic Aromatic Hydrocarbons in Marine Sediments**
*Dongye Zhao, The Connecticut Agricultural Experiment Station, New Haven, CT*

length. A case study will be used to demonstrate how to use the model. Uncertainties associated with the modeling approach will also be discussed as the plume length is estimated.

### WORKSHOP 9
### Results of Air Force Remedial Process Optimization Guidance Document and Demonstration

*Peter R. Guest, John W. Anthony, Douglas C. Downey and William A. Plaehn, Parsons Engineering Science, Inc. and Javier Santillan, AFCEE/ERC*

During the next decade, the Department of Defense (DoD) will spend over $1 billion per year to operate, maintain, and monitor (OM&M) of environmental remediation systems. In addition to exercising good stewardship of these taxpayer dollars, the DoD will be responsible for ensuring that each remediation system is effectively making progress toward site cleanup objectives and remains protective of human health and the environment. To assist Air Force environmental managers, the Air Force Center for Environmental Excellence (AFCEE) is providing practical guidance for evaluating existing remediation systems. Remedial process optimization (RPO) is a systematic approach for evaluating and improving the effectiveness and efficiency of site remediation. The goal is to achieve maximum risk reduction for each dollar spent. RPO reviews why certain cleanup goals were established and updates those decisions based on new regulatory options, while assessing "how" the current system can meet those goals most efficiently. The Air Force goals for the RPO program are to 1) assess the effectiveness of the remedial action; 2) enhance the efficiency of the remedial action; and 3) when possible, identify OM&M cost savings in excess of 20 percent per year for each system evaluated.

Parsons ES prepared an RPO handbook and field-tested the approach at six Air Force installations undergoing remediation, including three bases in California. The handbook, which will be provided to workshop participants, provides an introduction to RPO concepts, and guidance on evaluating site cleanup goals, measuring the effectiveness of remediation systems, optimization methods for common technologies and monitoring networks, and implementing RPO recommendations. It also provides valuable cross-references to more specific RPO topics that are available electronically. This workshop will present the concepts in the RPO handbook, RPO case studies for the three California Air Force bases, and lessons learned from the field tests, which were incorporated into the final RPO guidance document. Workshop participants will learn how to evaluate and optimize remediation systems and potentially save thousands of dollars in OM&M costs.

## WEDNESDAY, MARCH 22

**Workshops 10,11,12 - 7:00pm - 9:00pm**

### WORKSHOP 10
### MTBE Regulatory Roundtable

*Paul T. Kostecki, University of Massachusetts, Amherst, MA*

*Note:* This workshop is free to municipal, state and federal employees who are registered for the conference. Please check this workshop on the registration form to reserve your space.

The regulatory basis for methyl tertiary butyl ether (MTBE) cleanup approaches by state regulatory agencies will be discussed. The first part of the workshop will include a summary and discussion of a state-by-state survey conducted by the Association for the Environmental Health of Soils. Survey results identify analytical methodologies, human health and environmental risk assessment approaches as well as acceptable remedial technologies currently being applied. Representatives from several states across the country will discuss details of their approaches.

### WORKSHOP 11
### GeoTracker and GEIMS: California State Water Resources Control Boards' Integrated Ground Water Management System

*James G. Giannopoulos, Chief of the Regulatory Program Branch, Division of Clean Water, Anne M. Happel, Lawrence Livermore National Laboratory, MTBE Project Manager and Brendan P. Dooher, Lawrence Livermore National Laboratory, GEIM/GeoTracker Technical Lead*

There is an urgent need to change the way California agencies manage environmental data. With the invention of the Internet, the once difficult-to-near-impossible task of accessing data from various agencies for thousands of contaminant sites or public wells can be made simple. A standardized database, the Geographic Environmental Information Management System (GEIMS) has been created, populated with environmental data from multiple agencies across the State, and made accessible over the Internet using the GIS program GeoTracker. GEIMS/GeoTracker are powerful tools enabling users to store, collect, retrieve, analyze, and display environmental geographic data with relative ease and is available to the public over the Internet. GEIMS, which was designed to deal with any contaminant site and its effect on water resources, will act as an important hub for integrating information from multiple agencies about contaminant sites and water resources. Thus local and state agencies managing contaminant sites, as well as all other stakeholders, will have efficient access to each other's data, thereby increasing communication and creating the foundation of a consistent management framework. The SWRCB is now expanding the GEIMS/GeoTracker system to a statewide basis, and is working with DHS to significantly improve the accuracy of well location data within a one-year time frame. Already, the California Energy Commission and Air Resources Control Board, as well as some of the local agencies are investigating the opportunity to benefit from the SWRCB's implementation of GEIMS/GeoTracker. Implementation by the SWRCB of a statewide system will dramatically increase the ability for contaminant site regulators and environmental consultants to access, review, and analyze environmental data. This statewide system has the potential to minimize the threat of leaks from underground fuel tanks (or other contaminant sites) to drinking water sources by providing a means to prioritize sites that are closest to public water sources. Implementation of a statewide system will result in contaminant and water resource management tools that can dramatically transform the way contaminant site regulators and industry make cleanup decisions and establish priorities for managing cleanup. A statewide system will improve water resource management by allowing data to be integrated quickly into the process by which cleanup management decisions are made.

This workshop will discuss the Internet accessible database and GIS in detail, and will show where the SWRCB is planning to proceed in its implementation.

### WORKSHOP 12
### Update on Petroleum Hydrocarbon Issues in California: Implications for Site Closure

*Dawn A. Zemo, Gregory P. Brorby and Gary R.Foote, Geomatrix Consulting*

In California and other states where no formal Risk-Based Corrective Action (RBCA) policy has been implemented, the pathway for achieving closure at sites impacted by petroleum hydrocarbons can be ambiguous. This issue can be confounded in states like California, where multiple autonomous agencies oversee petroleum hydrocarbon sites. This workshop will provide an update on several important petroleum hydrocarbon issues in the State of California, and will discuss how these issues affect our ability to achieve closure. These issues are also relevant in other non-RBCA states. Specific issues to be addressed include:

Regulatory Guidance for Site Closure. Although California has no statewide policy prescribing requirements for closure of petroleum hydrocarbon sites, most of the nine Regional Boards have developed guidance defining "low risk" sites. Low-risk sites generally can be closed, provided that certain criteria are met. This portion of the workshop will summarize guidance established by each of the Regional Boards and identify key criteria that must be met to achieve site closure.

Chemistry of Petroleum Hydrocarbons and Fuel Oxygenates. This portion of the workshop will briefly review the chemistry of petroleum hydrocarbons, the fate and transport of general classes of hydrocarbon constituents, and weathering of petroleum after it has been released to the environment. Special consideration will be given to the chemistry and fate of fuel oxygenates such as MTBE. We will also illustrate how the failure to understand hydrocarbon chemistry and degradation can lead to a misinterpretation of analytical data, which can impede the process of obtaining site closure.

Human and Ecological Risk Issues. Obtaining closure at "low risk" petroleum hydrocarbon sites requires an assessment of potential human and ecological risks associated with the residual petroleum. California has no official methodology for assessing risk of these complex mixtures but several different approaches have been proposed within California and throughout the nation. This portion of the workshop will review various approaches for assessing risk of petroleum hydrocarbon mixtures and provide guidance about when it is appropriate to use each approach.

Natural Attenuation as a Remedial Alternative. A 1995 study by Lawrence Livermore National Laboratory recommended that passive bioremediation (i.e., natural attenuation) be considered as a remedial alternative at most petroleum hydrocarbon sites. Some regulators in California have been willing to accept natural attenuation as a viable remedial alternative while others have been reluctant to do so. This portion of the workshop will review current state of the practice in California for implementing natural attenuation as a remedial alternative at sites affected by petroleum hydrocarbons.

Removal of Free Product. It is generally assumed that State and Federal regulations require complete removal of free product prior to obtaining site closure. However, in certain situations, regulatory agencies have allowed free product to remain in place. This portion of the workshop will review exactly what State and Federal regulations say and do not say about free product removal.

The workshop instructors will present several case studies to illustrate the issues presented. Workshop participants will receive a notebook containing presentation materials as well as an indexed compendium of relevant regulatory guidance documents issued by each of California's nine Regional Water Quality Control Boards.

# Workshops

Workshops

## MONDAY, MARCH 20

**Workshop 1 - 8am - Noon**
**Workshop 2 - 1pm - 4pm**
**Workshops 3,4 - 2pm - 5pm**
**Workshops 5,6 - 4pm - 6pm**

### WORKSHOP 1
### SW-846: New Model, Technologies and Techniques

*Jeff Meyers, Morrison Knudsen Corporation, Littleton, CO*

The GEM concept integrates the concepts of Data Quality Objectives (DQOs), Sampling Theory & Practice (STP) and Statistics.

US EPA' Office of Solid Waste is about to release a completely rewritten version of SW-846 Chapters 9 & 10 on sampling and statistics. The new SW-846 has used GEM as a model, ie. DQOs, STP and statistics. Presently, the new SW-846 is scheduled to be released in July. EPA expects a great deal of interest in the guidance, as it contains some new concepts and represents a major advancement in its required technical level. This workshop will present information on the new SW-846, highlighting the new model, technologies and techniques required.

### WORKSHOP 2
### A Multiphase Screening Method to Determine Fuel Immobility in the Unsaturated Zone

*Ed Brost, Chen Chiang, John Gustafson, Equilon Enterprises LLC and Gary Backett, Aqui-Ver Inc.*

***Note:* This workshop is free to municipal, state, federal and Shell/Equilon employees who are registered for the conference. Please check this workshop on the registration form to reserve your space.**

When fuel is released to the subsurface, it travels downward at a rate controlled predominantly by the effective conductivity toward the fuel. The effective conductivity is proportional to the intrinsic permeability and relative phase permeability of a particular soil. When fuel concentration is small, the relative permeability and therefore conductivity is also small because pore continuity toward the fuel phase is limited. For any soil, at some concentration threshold the fuel is completely immobilized (termed residual saturation). Once immobilized, the direct threat from fuel migration to the water table is eliminated and only a potential leaching risk remains. Given the exponential relationship between fuel concentration and mobility, one finds the range of protective residual saturation values to be large. Because the range of values for residual saturation is wide, there is a need for a realistic yet conservative set of screening values for this parameter.

This workshop provides an overview of fuel mobility theory supported by field and lab observations to develop conservative mobility thresholds of residual saturation. The basis for technically defendable screening values for residual saturation for several common hydrocarbon mixtures in a variety of soils will be discussed. Sample problems will be used to illustrate the principles covered during the workshop.

### WORKSHOP 3
### Sampling Designs and Statistical Methods in Environmental Studies

*Nagaraj K. Neerchal, University of Maryland, Baltimore, MD and Steven P. Millard, Probability, Statistics and Information, Seattle, WA*

Federal and State regulations mandate the use of statistical methods to assess data from soil remediation and groundwater monitoring programs. Two key issues that must be addressed in any environmental study are how many samples to take and where the sampling sites should be located. This workshop presents an introduction to statistical concepts and data analysis methods used in environmental monitoring and remediation in the context of various sampling designs. Traditional simple random sampling and stratified random sampling designs are explained, as well as composite sampling and ranked set sampling, which provide a cost-effective way to locate "hot spots" of high contamination. Sample size considerations are presented from the point of view of balancing the expected cost of incorrectly declaring the site is contaminated vs. incorrectly declaring the site is not contaminated. The pros and cons of various statistical tests for contamination (e.g., t-test, upper tolerance limit, quantile test, etc.) are discussed. A case study is used to illustrate the concepts and methods.

### WORKSHOP 4
### Air Sparging: Evaluation, Design and Case Studies

*Rick Johnson, Illa Amerson, Oregon Graduate Institute, Beaverton, OR, Chris Coonfare, Keith Fields, Battelle Memorial Institute, Columbus, OH and Cristin Bruce, Arizona State University, Tempe, AZ*

This workshop will present the latest research on method for evaluating the potential feasibility of air sparging and also will present the current design approach recommended by the U.S. Air Force and U.S. Navy. In addition, case studies from on-going air sparging sites will be presented and discussed. The U.S. Air Force/U.S. Navy Air Sparging Design Paradigm will be provided at the workshop.

### WORKSHOP 5
### Environmental Fate of Hydrocarbons in Soils and Groundwater

*James Dragun, The Dragun Corporation, Farmington Hills, MI*

This workshop covers predicting bulk hydrocarbons migration, the extent of adsorption of organic chemicals, chemical volatility in soil, organic chemical reaction rates, and rates of organic chemicals in soils. The information presented is in the context of site remediation, site disposal facilities, and analyzing chemical releases as auditing closures of industrial facilities. James Dragun's book, Soil Chemistry of Hazardous Material, Second Edition, will be provided to registered participants.

### WORKSHOP 6
### MTBE Remediation Workshop

*Ellen Moyer, James P. Galligan and Michael E. Flack, ENSR Corporation, Acton, MA*

This hands-on workshop will first review vital chemical characteristics of MTBE such as solubility, vapor pressure, and how these characteristics influence remedial strategy. With that foundation, the optimization of typical remedial technologies employed at service stations will be evaluated. The feasibility and selection criteria for appropriate technologies, including natural attenuation will then be exposed. Several case studies will be used to demonstrate effective remediation scenarios.

## TUESDAY, MARCH 21

**Workshops 7,8,9 - 7:00pm - 9:00pm**

### WORKSHOP 7
### Moving Phytoremediation out of the Laboratory and into the Field

*Lee A. Newman, University of Washington, Seattle, WA, Michael Meyer, URS Greiner Woodward Clyde, Seattle, WA and Alan J.M. Baker, University of Sheffield, Sheffield, UK*

Phytoremediation is a new and exciting technology that is beginning to move from research to implementation. But like all new technologies, it has growing pains. Scale up does not just equate to increasing the number of plants. In this workshop, we will have a panel of people, from academia and industry, who have taken phytoremediation from the laboratory and into the field. We will discuss:

- feasibility studies, work plan development, working with regulators, as well as deployment in the field
- problems that were encountered, how they were overcome, and how we would have handled them in hindsight
- how the languages and the goals of the academic, regulator and consultant need to come together to generate a workable plan the meets everybody's needs.

The panel will consist of people who have worked with metal contamination, and soil and groundwater contamination with organic compounds. The workshop will include a short presentation by each of the panel members about their own work, but will focus on the needs and questions of the participants.

### WORKSHOP 8
### Use of PC Spreadsheet Analytical Model to Estimate MTBE Plume Length

*Yue Rong, Los Angeles Regional Water Quality Control Board and Ravi Arulanantham, San Francisco Regional Water Quality Control Board*

***Note:* This workshop is free to municipal, state and federal employees who are registered for the conference. Please check this workshop on the registration form to reserve your space.**

Since groundwater resources have been impacted by methyl tertiary butyl ether (MTBE), tremendous efforts have been given to understand its fate and transport in the subsurface environment. MTBE plume length study in groundwater has been a part of the efforts. Use of modeling approach is one of the methods to study plume length.

This session will present the analytical solution of the Domenico Model (1987) in an Excel spreadsheet format. The model has an analytical solution with the assumptions of the steady state, fixed source area, 1st order decay rate, and MTBE concentration calculated at the plume centerline.

The advantage of the spreadsheet model is to use field groundwater monitoring data to calibrate the three input parameters: dispersivity, groundwater velocity, and the first order decay rate. With the support of field data, we are able to fix a combination of these three input variables. After these three input parameters are determined, the model is deemed to be verified by the site-specific data. The model is then used to predict the MTBE plume

# Sessions

## Wednesday, March 22, 2000 — MORNING SESSIONS — 8:00am-Noon

### Session 1: MTBE

**Perspective on In-Situ MTBE Plume Bioremediation**
*Sonya M. Webb, Naval Facilities Engineering Service Center, Port Hueneme, CA*

**Root Uptake and Transportation of Gasoline Oxygenates in Shallow Groundwater by *Pinus radiata***
*Dennis G. Parfitt, California EPA, Sacramento, CA*

**In-Situ Bioremediation of TBA and MTBE Spills at a Fuel Oxygenate Production Facility**
*Richard E. Woodward, Sierra Environmental Services, Houston, TX*

**MTBE Removal Using Horizontal In-Situ Air Sparging**
*Cannon F. Silver, Parsons Engineering, Pasadena, CA*

**Rapid MTBE and BTEX-Napth Oxidation at Spill Sites**
*William B. Kerfoot, K-V Associates, Mashpee, MA*

**Evaluation of GAC Technology Using Rapid Small-Scale Column Tests (RSSCTs) for Methyl Tertiary Butyl Ether (MTBE) Removal from Drinking Water**
*Tom C. Shih, UCLA, Los Angeles, CA*

**Ecotoxicity Reference Values for Selected Ethers/Alcohols in Soil and Water**
*Eugene R. Mancini, E.R. Mancini & Associates, Camarillo, CA*

### Session 2: RISK/RBCA

**A Model of Collaborative Decision Making Process in the Nation's Capital for the 21st Century - RBCA 2000**
*Theodore J. Gordon, Government of the District of Columbia, Washington, DC*

**Low Risk Closure Approach at an Urban California Petroleum Release Site**
*Paula J. Hansen, Geomatrix Consulting, Oakland, CA*

**Benzidine False Positive at Manufactured Gas Plant Remediation: Implications for QA/QC Evaluation, Risk Assessment and Liability**
*Eric M. Cherry, Hull & Associates, Dublin, OH*

**Influence of Aquifer Transport Processes on Environmentally Acceptable Endpoints**
*Venkatesh Uddameri, University of California, Davis, CA*

**Developing Risk-Based Cleanup Levels for Radionuclides Using Two Regulatory Approaches**
*Arthur F. Eidson, IT Corporation, Houston, TX*

**Sustaining Risk-Based Corrective Measures**
*Lester Feldman, Geomatrix Consulting, Oakland, CA*

### Session 3: INNOVATIVE TECHNOLOGIES

**Six-Phase Heating for In-Situ Remediation**
*Brett Trowbridge, Current Environmental Solutions, Dana Point, CA*

**An Evaluation of the Effectiveness of Oxygen-Releasing Chemicals in BTEX Remediation**
*Cortland S. Hill, Black Ice Environmental, Tallahassee, FL*

**Evaluation of Biopile Treatment for Petroleum Hydrocarbon Contaminated Soil at a Superfund Removal Action Site**
*John A. Glaser, US EPA, NRMRL, Cincinnati, OH*

**Passive Bioventing in Stratified Soils and Shallow Groundwater Conditions**
*Michael B. Phelps, Parsons Engineering Science, Oakland, CA*

**In-Situ Soil and Groundwater Remediation of Volatile Organic Compounds using Fenton's Reagent and Ozone Sparging**
*Bruce E. Ehleringer, Morrison Knudsen Corporation, Cleveland, OH*

**Input/Output Tests for Chlorinated Dioxins and Furans During Catalytic Oxidation of VOC-laden Air**
*F.A.M. Buck, King, Buck Technology, San Diego, CA*

**LUNCHEON PRESENTATION (12pm-1:30pm, Presentation begins at 12:30pm)**
**A SURVEY AND COMPARISON OF GASOLINE UST REGULATIONS AND DESIGN STANDARDS EMPLOYED IN CALIFORNIA AND THE NORTHEASTERN U.S.**
*Frank R. Sweet, ENSR Corporation, Acton, MA*

## Wednesday, March 22, 2000 — AFTERNOON SESSIONS — 1:30pm-5:30pm

### Session 1: MTBE

**New MTBE Cleanup Guidelines for California**
*Kevin Graves, State Water Resources Control Board, Sacramento, CA*

**Gasoline Oxygenates: Is There a "Safer" Alternative to the use of MTBE**
*Heriberto Robles, LFR, Inc., Irvine, CA*

**Fate, Transport and Remediation of Ethanol and other Gasoline Oxygenate Additives**
*James M. Davidson, Alpine Environmental, Fort Collins, CO*

**Estimation of MTBE Plume Length Using Domenico Analytical Model**
*Weixing Tong, California Regional Water Quality Control Board, Los Angeles, CA*

**GEIMS and GeoTracker: Using the Internet to Manage Environmental Impacts and Water Resources**
*Brendan P. Dooher, Lawrence Livermore National Laboratory, Livermore, CA*

**Multi-Technology Management of Methyl Tert-Butyl Ether (MTBE)**
*James T. Gibbs, Battelle Memorial Institute, Columbus, OH*

**The Fate and Transport of Methyl Tert-Butyl Ether (MTBE) in Small Surface Spills of Gasoline**
*Andrew Stocking, Malcolm Pirnie, Oakland, CA*

### Session 2: HEAVY METALS

**Results of a Field Demonstration of the In-Situ Gaseous Reduction Approach**
*Edward C. Thornton, Pacific Northwest National Laboratory, Richland, WA*

**Background Arsenic Concentrations in Different Soils in Florida**
*Lena Q. Ma, University of Florida, Gainesville, FL*

**Determination of Ambient Nickel Concentrations in Mixtures of Serpentinite and Non-serpentinite Fill Materials**
*James A. Frampton, CA Department of Toxic Substances Control, Sacramento, CA*

**Microbial Sulfate Reduction of Acid Mine Drainage: Toxicity and Biosorption of Metal Ions**
*Vivek P. Utgikar, US EPA, NRMRL, Cincinnati, OH*

**Adaptive Electrokinetics Remediation of Heavy Metal Contaminated Soils**
*Krishna R. Reddy, University of Illinois, Chicago, IL*

**A Risk-Based Approach to Determine Remedial Requirements at Closed Firing Ranges**
*Linda B. Murray, Parsons Engineering Science, Denver, CO*

**Geostatistical Analysis for Lead Contamination at a Former Incinerator Site**
*Ge Gina Ling, Hawaii State Department of Health, Honolulu, HI*

### Session 3: ENVIRONMENTAL FORENSICS

**Evaluating Remediation Needs and Options: A Fraction-Specific Approach to Soil and Groundwater TPH Analysis**
*Kevin J. McCarthy, Battelle, Duxbury, MA*

**PAH Distributions in Soils: Implications for Source Characterization and Risk Assessment**
*Eric M. Cherry, Hull & Associates, Dublin, OH*

**Dating a Chlorinated Solvent Release: 1982 or 1994**
*Gary L. Brugger, Exponent Environmental Group, Bellevue, WA*

**Discriminating Among Multiple Sources of Lead and Arsenic at a Chemical Facility**
*Richard W. Hurst, Hurst & Associates, Thousand Oaks, CA*

**Quality Science in the Courtroom**
*George Brilis, US EPA, Las Vegas, NV*

**G.I.S. and Environmental Forensics**
*George Brilis, US EPA, Las Vegas, NV*

# Sessions

## Thursday, March 23, 2000 — MORNING SESSIONS — 8:30am-Noon

### Session 1: PERCHLORATE

**Adsorption Characteristics of Perchlorate in Soils**
*Sridhar Susarla, US EPA, NERL, Athens, GA*

**Risk Assessment of Perchlorate Contamination at an Agriculture Field**
*Heriberto Robles, LFR, Inc., Irvine, CA*

**Perchlorate Uptake in Leafy Vegetation from Fertilizer and Irrigation Water**
*Stacy Lewis Hutchinson, US EPA, Ecosystems Research Division, Athens, GA*

**Application of Vascular Plants for Bioremediation of Perchlorate: Unraveling the Mysteries**
*Sydney T. Bacchus, University of Georgia, Athens, GA*

**Removal of Perchorate and Trichloroethylene from Water by Terrestrial Plants**
*Valentine A. Nzengung, University of Georgia, Athens, GA*

### Session 2: NATURAL ATTENUATION

**When is Natural Attenuation the Right Choice?**
*Bruce E. Rittmann, Northwestern University, Evanston, IL*

**Observed Natural Attenuation of TCA in Groundwater**
*Daniel B. Stephens, Daniel B. Stephens & Associates, Albuquerque, NM*

**Enhanced Natural Attenuation of Chlorinated Solvents in Upland and Adjacent Wetland Groundwater**
*Dean L. McInnis, Fuel Man Environmental, West Largo, LA*

**Natural Attenuation of TCE at Duluth International Airport**
*Pinaki Banerjee, Harza Engineering Company, Chicago, IL*

**Temporal Analysis of Methyl Tertiary-butyl Ether (MTBE) Groundwater Plumes at California LUFT Sites**
*Edwin H. Beckenbach, Lawrence Livermore National Laboratory, Livermore, CA*

**Protocol for Determining the Natural Attenuation Rates of Polycyclic Aromatic Hydrocarbons (PAHs) in Contaminated Soils**
*Qi Song, University of Cincinnati, OH*

**LUNCHEON PRESENTATION (12:00pm-1:30pm, Presentation begins at 12:30)**
**AN INTEGRATED APPROACH TO ENVIRONMENTAL RISK REDUCTION OPTIONS SELECTION: ELEMENTS OF A RECENT CONTRIBUTION BY ENVIRONMENTAL ENGINEERING COMMITTEE (EEC) OF EPA'S SCIENTIFIC ADVISORY BOARD**
*Hilary I. Inyang, Center for Environmental Engineering Science and Technology (CEEST), University of Massachusetts, Lowell, MA*

## Thursday, March 23, 2000 — AFTERNOON SESSION — 1:30pm-5:00pm

### Session 1: INNOVATIVE TECHNOLOGIES - CHLORINATED SOLVENTS

**Time-Release Electron Donor Technology for Accelerated Biological Reductive Dechlorination**
*Stephen S. Koenigsberg, Regensis Bioremediation Products, San Clemente, CA*

**In-Situ Chemical Oxidation of a Chlorinated Groundwater Plume Using the ISOTEC℠ Process**
*Richard S. Greenberg, In-Situ Oxidative Technologies, West Windsor, NJ*

**Enhanced Criegee Oxidation of Chlorinated Ethenes**
*William B. Kerfoot, K-V Associates, Mashpee, MA*

**CROW™ Process Application for Sites Contaminated with Light Non-Aqueous Phase Liquids and Chlorinated Solvents**
*L.A. Johnson, Jr., Western Research Institute, Laramie, WY*

**Accelerated In-Situ Bioremediation of Chlorinated Ethenes in Groundwater at Point MUGU IRP Site 24**
*Rodney S. Skeen, Battelle PNWD, Richland, WA*

# Posters

**Posters may be viewed throughout the 3 day conference.**
**Authors will be available at their posters Tuesday, March 21, and Wednesday, March 22, from 4-6pm.**

**Remediation of an Oilfield Brine Spoil to Restore Native Southern Pine Species**
*Eric Anderson, Arthur Temple College of Forestry, Nacogdoches, TX*

**Paper Boxes to Wood Houses: A Successful Expedited (Brownfields) Redevelopment in Newark, California**
*Martin B. Bloes, Geomatrix Consultants, Inc., Oakland, CA*

**RCRA Corrective Action an Asset in the Redevelopment Strategy of a Former Solvent Recycling Facility**
*Gary L. Brugger, Exponent Environmental Group, Bellevue, WA*

**Insights on the Environmental Impact of Mine Tailings Effluents using Twenty-Four Hour Monitoring**
*Benjamin Castellana, Ecology & Environment, Long Beach, CA*

**Metal Toxicity and Biosorption Studies of Pure Culture Isolates of Sulfate Reducing Bacteria in Acid Mine-Drainage Treatment Systems**
*Bor-Yann Chen, US EPA, NRMRL, Cincinnati, OH*

**Handbook of Graphical and Statistical Analysis to Identify Contaminants of Potential Concern at Navy Sites**
*Richard O. Gilbert, Battelle Washington Office, Washington, DC*

**Bioremediation of Oily Waste in an Aerated Column Recycling Batch Reactor**
*Fred Goetz, Naval Facilities Engineering Service Center, Port Hueneme, CA*

**Chlorinated Solvents Delineation and Remediation: A Case Study**
*Robert E. Helton, Law Engineering & Environmental Services, Inc., Miami Lakes, FL*

**Reality Check? Soil Vapor Data Applied to Evaluation of Chemical Migration from Groundwater to Air**
*Ann M. Holbrow, Geomatrix, Oakland, CA*

**Non-Reactive Solute Dispersion in Triassic Sandstone: Laboratory Simulation and an Application to the Field**
*Wei Huang, University of Sheffield, Sheffield, United Kingdom*

**Bioremediation of Petrochemical Contaminants in Unsaturated Soil**
*Wei Huang, University of Sheffield, Sheffield, United Kingdom*

**Study of Innovative & Standard Technologies for Assessment and Remediation Projects at Drycleaning Sites**
*Robert Jurgens, Kansas Department of Health & Environment, Topeka, KS*

**The Effect of Surface Contact on Dermal Absorption of Pesticides from House Dust**
*Garrett Keating, Lawrence Livermore National Laboratory, Livermore, CA*

Posters (cont.)

**Restoration of a Freshwater Wetland at Naval Construction Battalion Center, Port Hueneme**
*John Kornuc, Naval Facilities Engineering Service Center, Port Hueneme, CA*

**Development and Validation of a Mass Balance Nutrient Loading Model: Case Study-Malibu Lagoon, CA, USA**
*Chris B. Liban, ThermoRetec Consulting Corporation, Carson, CA*

**Soluble Contaminants and the Molecular Structure of Water: Implications for Remediation**
*D.L. Marrin, San Diego University, Solana Beach, CA*

**Development of Jet Fuel Aquatic Standard for Cleanup at San Francisco International Airport**
*Stephen L. Meek, Burns & McDonnell Waste Consultants, Inc., Kansas City, MO*

**Detection of Polluting Grade of Soil in a Foliage Plant-Pot Using Tin Oxide Gas Sensor**
*Takashi Oyabu, Kanazawa University of Economics, Ishikawa, Japan*

**Root Uptake and Transportation of Gasoline Oxygenates by Pinus Radiata**
*Dennis G. Parfitt, California EPA, Sacramento, CA*

**Washington State's New Approach for Assessing Leaching Potential for Petroleum Release Sites: Pros and Cons**
*Hun Seak Park, Washington Pollution Liability Insurance Agency, Olympia, WA*

**Risk-Based Preliminary Remediation Goals Versus "Not to Exceed" Goals**
*Angela Patterson, CDM Federal Programs Corporation, San Diego, CA*

**Discrimination of Aerial Deposition Sources of PCDDs/PCDFs Downwind from a Ketchikan, Alaska, Pulp Mill**
*Daniel Peek, Exponent, Bellevue, WA*

**Case Study of Enhanced Ex-Situ Soil Bioremediation at Bong Recreation Park, Kansasville, Wisconsin**
*Murhty Polasa, Stiles Environmental, Inc., Lake Mills, WI*

**Sources of Elevated Arsenic Concentrations in Soils at Mare Island Naval Shipyard, Vallejo California**
*Vladimir Prilepin, Tetra Tech EM, Inc., San Francisco, CA*

**Availability of Heavy Metals and Radionuclides in Soils Amended with Phosphate Rocks**
*I.A.A. Saad, University of Malaya, Kuala Lumpur, Malaysia*

**The Fate of Heavy Metals Added to Three Malaysian Soils**
*I.A.A. Saad, University of Malaya, Kuala Lumpur, Malaysia*

**Community Response and Health Assessment of PCB Release from a Natural Gas Pipeline Rupture**
*Erin Shay, McLaren/Hart, Pittsburgh, PA*

**A Nutrient Budget for Malibu Lagoon, California**
*Shelby E. Sheehan, University of California, Los Angeles, CA*

**Bioremediation of Diesel Spoilt Sites by Rhizospheric Soil from Different Crops**
*Sudhir Syal, Thapar Institute of Engineering & Technology*

**State Programs to Clean up Dry Cleaners**
*Dale Trippler, Minnesota Pollution Control Agency, St.Paul, MN*

**Enzyme Enhance Bioremediation of Fuel Contaminated Soil at Thule Air Base, Greenland**
*Robert L. Vinson, Versar, Inc., San Antonio, TX*

**Screening of Highly Lead-Tolerant and Sensitive Varieties in Rice**
*Young-Yell Yang, Pohang University of Science & Technology, Pohand, Korea*

**Lead Removal from Three Small-Arms Ranges**
*Thomas C. Zwick, Battelle Memorial Institute, Columbus, OH*

## Scientific Advisory Boards

The success of this conference has largely been the result of a very dedicated and hard working Scientific Advisory Board (SAB). The SAB evaluates abstract submissions, recommends invited papers and presenters, advises with regard to session topics, and serves as conference ambassadors. The SAB is crucial to the conference development. Care is taken to create a board which represents philosophical, scientific, regulatory, and geographical balance.

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